

Railway applications - Electric equipment for rolling stock - Part 1: General service conditions and general rules

## EESTI STANDARDI EESSÕNA

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English Version

## Railway applications - Electric equipment for rolling stock - Part 1: General service conditions and general rules (IEC 60077-1:2017)

Applications ferroviaires - Equipements électriques du matériel roulant - Partie 1: Conditions générales de service et règles générales  
(IEC 60077-1:2017)

Bahnanwendungen - Elektrische Betriebsmittel auf Bahnfahrzeugen - Teil 1: Allgemeine Betriebsbedingungen und allgemeine Regeln  
(IEC 60077-1:2017)

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## European foreword

The text of document 9/2266/FDIS, future edition 2 of IEC 60077-1, prepared by IEC/TC 9 "Electrical equipment and systems for railways" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60077-1:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-06-04
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-09-04

This document supersedes EN 60077-1:2002.

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## Endorsement notice

The text of the International Standard IEC 60077-1:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60071-1	NOTE	Harmonized as EN 60071-1.
IEC 60077-2	NOTE	Harmonized as EN 60077-2.
IEC 60077-3	NOTE	Harmonized as EN 60077-3.
IEC 60077-4	NOTE	Harmonized as EN 60077-4.
IEC 60077-5	NOTE	Harmonized as EN 60077-5.
IEC 60112	NOTE	Harmonized as EN 60112.
IEC 60216-5	NOTE	Harmonized as EN 60216-5.
IEC 60310:2016	NOTE	Harmonized as EN 60310:2016 (not modified).
IEC 60322	NOTE	Harmonized as EN 60322.
IEC 60364-4-41	NOTE	Harmonized as HD 60364-4-41.
IEC 60587	NOTE	Harmonized as EN 60587.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 61140	NOTE	Harmonized as EN 61140.
IEC 62271-100:2008	NOTE	Harmonized as EN 62271-100:2009 (not modified).
IEC 62271-100:2008/A1:2012	NOTE	Harmonized as EN 62271-100:2009/A1:2012 (not modified).

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## INTRODUCTION

Although this document specifies the general service conditions and general rules for electric equipment for railway rolling stock, further details for certain types of electric equipment may be given in other IEC standards.

IEC 60077 series consists of the following parts:

- Part 1 – General service conditions and general rules
- Part 2 – Electrotechnical components – General rules
- Part 3 – Electrotechnical components – Rules for DC circuit-breakers
- Part 4 – Electrotechnical components – Rules for AC circuit-breakers
- Part 5 – Electrotechnical components – Rules for HV fuses

Although all circuits of power or control electronic equipment connected to battery or contact line are covered by this document, internal circuits of these may be subject to special requirements covered by relevant product standards.

For electric equipment for rolling stock which conforms to an appropriate international standard, including items of industrial equipment, this document, plus the relevant equipment product standard for electric equipment where appropriate, specifies only those additional requirements to ensure satisfactory operation on rolling stock.

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# RAILWAY APPLICATIONS – ELECTRIC EQUIPMENT FOR ROLLING STOCK –

## Part 1: General service conditions and general rules

### 1 Scope

This part of IEC 60077 specifies the general service conditions and requirements for all electric equipment installed in power circuits, auxiliary circuits, control and indicating circuits etc., on railway rolling stock.

NOTE Some of these rules can, after agreement between the user and the manufacturer, be used for electrical equipment installed on vehicles other than railway rolling stock, such as mine locomotives, trolley buses, etc.

The purpose of this document is to harmonize as far as practicable all rules and requirements of a general nature applicable to electric equipment for rolling stock. This is in order to obtain uniformity of requirements and tests throughout the corresponding range of equipment to avoid the need for testing to different standards.

All requirements relating to:

- the environmental stresses expected during the normal service conditions;
- the construction;
- the performance and the associated tests which can be considered as general;

have therefore been gathered in this document together with specific subjects of wide interest and application, for example temperature rise, dielectric properties, etc.

In the event of there being a difference in requirements between this document and a railway rolling stock relevant product standard, then the product standard requirements take precedence.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60216-1, *Electrical insulating materials – Thermal endurance properties – Part 1: Ageing procedures and evaluation of test results*

IEC 60505, *Evaluation and qualification of electrical insulation systems*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-3-5, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations*

IEC 60850, *Railway applications – Supply voltages of traction systems*

IEC 61133:2016, *Railway applications – Rolling stock – Testing of rolling stock on completion of construction and before entry into service*

IEC 61373, *Railway applications – Rolling stock equipment – Shock and vibration tests*

IEC 61991, *Railway applications – Rolling stock – Protective provisions against electrical hazards*

IEC 61992-1, *Railway applications – Fixed installations – DC switchgear – Part 1: General*

IEC 62236-3-2, *Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus*

IEC 62497-1, *Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment*

IEC 62498-1:2010, *Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock*

### **3 Terms, definitions and abbreviated terms** (see also Annex A)

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### **3.1 General**

##### **3.1.1**

##### **rolling stock**

all the vehicles with or without motors

Note 1 to entry: Examples of vehicles include a locomotive, a coach and a wagon.

[SOURCE: IEC 60050-811:2017, 811-02-01]

##### **3.1.2**

##### **vehicle**

single item of rolling stock